What is claimed is:

1. A method for encoding ATM cells for transmission over a wireless link comprising the steps of:

receiving an ATM cell stream comprised of a plurality of ATM cells;

detecting idle/unassigned cells within said cell stream;

assembling a header frame made up of headers of a number of said plurality of ATM cells;

assembling a payload frame made up of payloads of said number of said plurality of ATM cells; and

placing some of the detected idle/unassigned cells in a selected portion of the payload frame.

2. A method according to claim 1 wherein said header frame is arranged in an i row x n column matrix.

3. A method according to claim 1 wherein said payload frame is arranged in an j row x m column matrix.

4. A method according to claim 1, wherein said step of assembling said header frame further comprises:

partitioning said header frame comprised of headers of an n number of ATM cells into a first section and a second section;

said first section comprised of n - x number of headers of said n number of ATM cells and an added cell made up of control bytes; and

said second section comprised of x number of headers of said

n number of ATM cells.

5. A method according to claim 1, wherein said step of assembling said header frame further comprises:

adding a predetermined number of bytes of Header Error Correction Code (HECC) to said header frame.

6. A method according to claim 5, wherein said Header Error Correction Code is generating using a Reed-Solomon coding scheme.

7. A method according to claim 1, wherein said step of placing idle/unassigned cells further comprises:

adding extra Payload Error Correction Code in any idle/unassigned cells which are placed in said selected portion of said payload frame.

8. A method according to claim 1, wherein said step of assembling said payload frame further comprises:

adding a predetermined number of bytes of Payload Error Correction Code (PECC) to said payload frame.

9. A method according to claim 8, wherein said Payload Error Correction Code is generated by a Reed-Solomon coding scheme.

10. A method for transmitting ATM cells received from a

wireline interface over a wireless link comprising:

receiving an ATM cell stream comprised of a plurality of ATM cells from said wireline interface;

encoding said plurality of ATM cells, wherein said encoding step includes the steps of:

detecting idle/unassigned cells within said cell stream,

assembling a header frame made up of headers of a first predetermined number of said plurality of ATM cells arranged in a first matrix,

assembling a payload frame made up of payloads of said first predetermined number of said plurality of ATM cells arranged in a second matrix, and

placing up to a second predetermined number of the detected idle/unassigned cells to an end of the payload and header frames, starting with a last column of each of said frames; and

transmitting said predetermined number of said plurality of ATM cells over said wireless link by interleaving said header frame and said payload frame.

11. A method according to claim 10, said step of transmitting further comprising:

interleaving by transmitting a third predetermined number of bytes from said payload frame for every byte transmitted from said header frame.

12. A method according to claim 10, said step of transmitting further comprising:

adding a two byte synchronizing pattern to said header and

payload frames.

13. A method for storing information to be used by a receiving end of a wireless link relating to dynamic real time changes in encoding between an ATM frame to be transmitted over said wireless link and a subsequent ATM frame to be transmitted over said wireless link comprising:

encoding a plurality of ATM cells within an ATM cell stream, wherein said encoding step includes the steps of:

detecting idle/unassigned cells within said cell stream,

assembling an ATM frame having a header frame made up of headers of a first predetermined number of said plurality of ATM cells and a payload frame made up of payloads of said first predetermined number of said plurality of ATM cells,

placing up to a second predetermined number of the detected idle/unassigned cells in a selected portion of the payload frame, and

adding Payload Error Correction Code to those idle/unassigned cells which are placed in said selected portion of said payload frame; and

storing an idle/unassigned cell indicator in a first control byte in said header frame to be transmitted over said wireless link which indicates whether or not idle/unassigned cells have been placed at said selected portion of said payload frame; and

storing a count of the number of idle/unassigned cells contained in the payload frame in a second control byte within said header frame.

14. A method for recording information to be used at a receiving end of an ATM wireless link relating to original positions of moved idle/unassigned cells in an ATM frame, comprising:

recording original positions of idle/unassigned cells as they occur in a cell stream made up of a predetermined number of ATM cells used to assemble said ATM frame having a header frame and a payload frame;

moving idle/unassigned cells to new positions at a selected portion of said ATM frame; and

overwriting header bytes of each moved idle/unassigned cell with the recorded original positions of each corresponding moved idle/unassigned cell.

15. A method of transmitting ATM cells over a wireless link comprising the steps of:

receiving a plurality of ATM cells each having a header and a payload, said header including at least one Header Error Correction byte;

dropping said at least one Header Error Correction byte from said header of each ATM cell to thereby leave an unoccupied byte space in said header;

inserting other information into said unoccupied byte space; and

transmitting each of said plurality of ATM cells.

16. A method according to claim 15 further comprising the step of:

regenerating said Header Error Correction byte from the remaining bytes in said header of each ATM cell after transmission of each cell.

17. A method according to claim 15 further comprising:

generating a header syndrome; and

identifying bits in error using said header syndrome;

wherein when a single bit in error is identified in the header, correction of said bit in error is performed, and when multiple bits in error are identified in the header, an ATM containing said multiple bits in error is dropped and replaced by an idle/unassigned cell.

18. A method for preserving overhead parity bits present in each of a plurality of received ATM frames which are to be transmitted over a wireless link comprising:

flagging a first nibble occurring in each of said plurality of ATM frames received;

assembling header and payload frames for transmission over said wireless link consisting of a predetermined number of ATM cells derived from said plurality of ATM frames;

recording a position of each said first flagged nibble encountered in each said predetermined number of ATM cells in control bytes contained in said header frame; and

storing said overhead parity bits occurring in each of said plurality of ATM frames in control bytes contained in said header frame.

19. A method for encoding ATM cells for transmission over a wireless link comprising the steps of:

receiving an ATM cell stream comprised of a plurality of ATM cells each including a header and payload;

assembling a header frame comprised of headers of said plurality of ATM cells.

20. A method according to claim 19, wherein said step of assembling said header frame further comprises:

partitioning said header frame comprised of headers of said predetermined number of ATM cells into a first section and a second section;

said first section comprised of a second predetermined number of headers from said first predetermined number of ATM cells and an added cell made up of control bytes; and

said second section comprised of having a third predetermined number of headers from said first predetermined number of ATM cells.

21. A method for encoding ATM cells for transmission over a wireless link comprising the steps of:

receiving an ATM cell stream comprised of a plurality of ATM cells;

assembling a payload frame comprised of payloads of said plurality of ATM cells.

22. A method according to claim 21 wherein said payload frame is comprised of a predetermined number of said plurality

of ATM cells arranged in a matrix comprised of an i number of rows and a j number of columns.

23. A method according to claim 22, wherein said step of assembling said payload frame further comprises:

adding a predetermined number of bytes of Payload Error Correction Code (PECC) to all i number of rows of said payload frame.

24. A method according to claim 23, wherein said Payload Error Correction Code is generated by a Reed-Solomon coding scheme.

25. A method for encoding ATM cells for transmission over a wireless link comprising the steps of:

receiving an ATM cell stream comprised of a plurality of ATM cells from a wireline interface;

detecting idle/unassigned cells within said cell stream;

assembling a payload frame comprised of payloads from said plurality of ATM cells; and

placing at least some of the detected idle/unassigned cells in a selected portion of the payload frame.

26. A method according to claim 25, wherein said step of placing idle/unassigned cells further comprises:

adding extra Payload Error Correction Code in those idle/unassigned cells which are placed in the selected portion of said payload frame.

27. A method according to claim 25, further comprising:

generating a header syndrome; and

identifying bits in error using said header syndrome;

wherein when a single bit in error is identified in the header, correction of said bit in error is performed, and when multiple bits in error are identified in the header, an ATM containing said multiple bits in error is dropped and replaced by an idle/unassigned cell.

28. A method for encoding ATM cells in a frame for transmission over a wireless link comprising the steps of:

detecting idle/unassigned cells in an ATM cell stream;

inserting error correction code into some of said idle/unassigned cells;

setting a first information field within said frame at a first state when error correction code has been inserted into any idle/unassigned cells within said frame; and

setting said first information field at a second state when no error correction code has been inserted into idle/unassigned cells within said frame.

29. A method according to claim 28, further comprising the step of:

storing a number of idle/unassigned cells used for extra error correction code in a second information field within said frame when said first information field has been set at said first state.

30. A method of restoring an ATM cell stream sequence after transmission over a wireless link comprising the steps of:

recording the original positions of idle/unassigned cells in a cell stream sequence before being moved during assembly of an ATM frame prior to transmission of said frame over said wireless link; and

restoring said original positions of said idle/unassigned cells within said cell stream based upon said recorded original positions after transmission of said frame over said wireless link.

31. An apparatus for receiving an ATM cell stream sequence via a wireline link, encoding said ATM cell stream for transmission of data via a wireless link, receiving and decoding encoded wireless data received via said wireless link and transmitting another ATM cell stream sequence via said wireline link, comprising:

a wireline interface for receiving said cell stream sequence from said wireline link and transmitting said another cell stream sequence;

an encoder receiving cell stream data from said wireline interface, encoding said cell stream data and outputting encoded cell data;

a wireless interface for receiving said encoded cell data from said encoder, transmitting said encoded cell data via said wireless link and receiving previously encoded cell data;

a decoder receiving said previously encoded cell data from said wireless interface, decoding said previously encoded cell

data and outputting said another cell stream sequence to said wireline interface; and

a control unit for controlling said interfaces, encoder and decoder.

32. An apparatus according to claim 31, wherein said encoder further comprises:

a cell preprocessor for receiving said cell stream data, monitoring header bytes of incoming cells, detecting idle/unassigned cells and outputting cell data;

a frame assembler for receiving said cell data from said cell preprocessor, assembling said data in a frame and outputting said frame;

an encoder unit for receiving said frame and encoding said frame according to a predetermined coding scheme;

and an interleaver for interleaving and transmitting said frame to said wireless interface.

33. An apparatus according to claim 31, wherein said decoder further comprises:

an acquisition and synchronization unit for receiving previously encoded cell data from said wireless interface, searching for a predetermined synchronization pattern in said previously encoded cell data, declaring a synchronization pattern, and outputting interleaved cell data;

a byte deinterleaver for deinterleaving said interleaved cell data received from said acquisition and synchronization unit, deinterleaving said interleaved cell data and outputting

deinterleaved cell data;

a decoder for decoding said deinterleaved cell data received from said byte deinterleaver according to a predetermined coding scheme and outputting decoded cell data;

and a cell assembler for receiving said decoded cell data; assembling the decoded cell data into said another cell stream sequence, and outputting said another cell stream data to said wireline interface for transmission via said wireline link.

34. A method for decoding interleaved and encoded data received over a wireless link comprising:

detecting a predetermined synchronization pattern in said encoded data received over said wireless link;

passing said data to a deinterleaver and decoder when said predetermined synchronization pattern has been detected;

determining a number of bytes in error in said data; and

declaring a synchronization mode when the number of bytes in error between successive synchronization patterns is less than a predetermined number.

35. A method according to claim 34, wherein said step of detecting includes setting a pattern search window of a predetermined number of bytes.

36. A method according to claim 34 further comprising a step of declaring an identification of said synchronization pattern when a predetermined number of bytes of data are detected as matching said predetermined synchronization pattern.

37. A method according to claim 36, wherein said predetermined number of bytes is two.

38. A method for decoding interleaved and encoded data transmitted and received over a wireless link comprising:

deinterleaving said data and rearranging said data into a predetermined frame;

decoding said data according to a predetermined coding scheme;

detecting if any cells within a Header frame within said predetermined frame are uncorrectable; and

replacing detected uncorrectable cells with idle/unassigned cells.

39. A method according to claim 38, wherein said step of rearranging said data further comprising:

checking control bytes contained with said Header frame to determine whether or not idle/unassigned cells were utilized for error correction in a Payload Frame within said predetermined frame;

reading a plurality of header bytes within said Header frame and forming a table of sequence numbers based upon said read header bytes;

reinserting idle/unassigned cells into said correct positions in said predetermined frame based upon said table of sequence numbers thereby restoring an order of cells occurring at a transmitting end of said wireless link.